June 17, 1930. I. W. COX 1,763,761

DRY STEAM FINISHER

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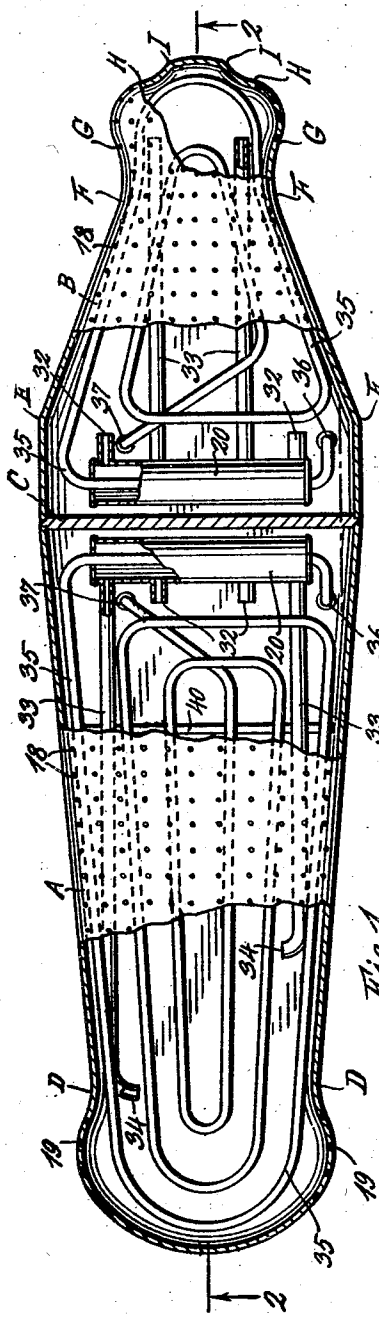


Fig. 1.

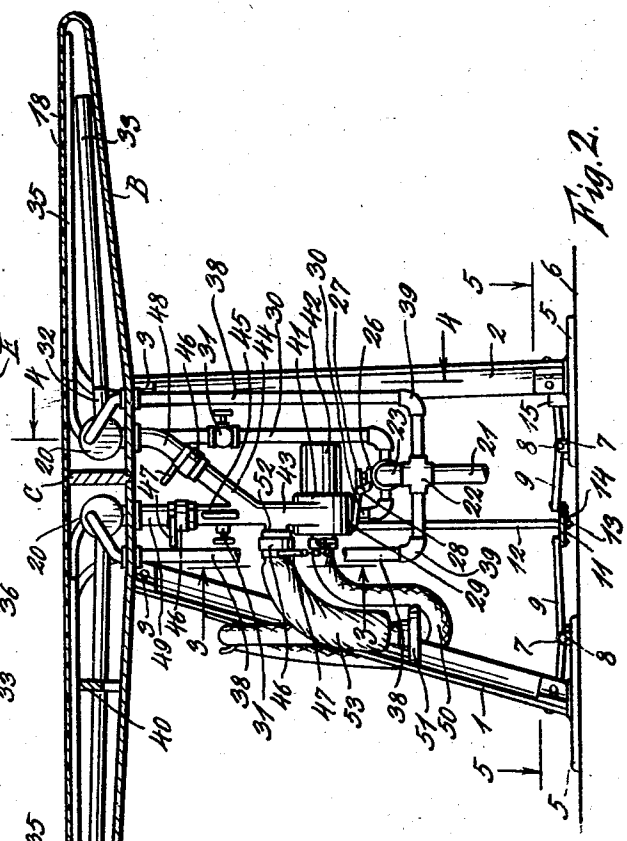


Fig. 2.

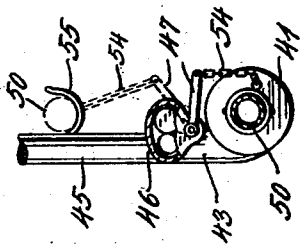


Fig. 3.

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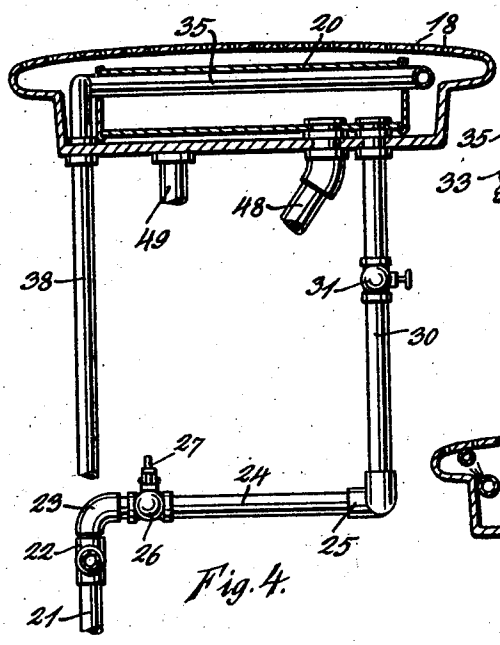


Fig. 4.

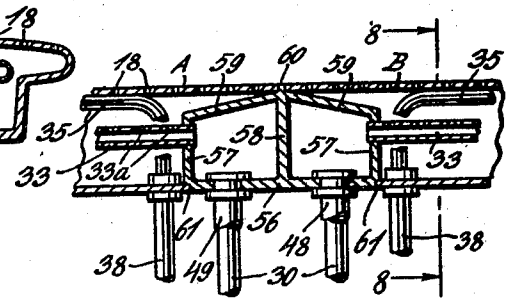


Fig. 7.

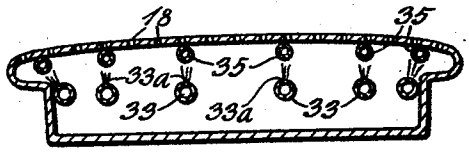


Fig. 8.

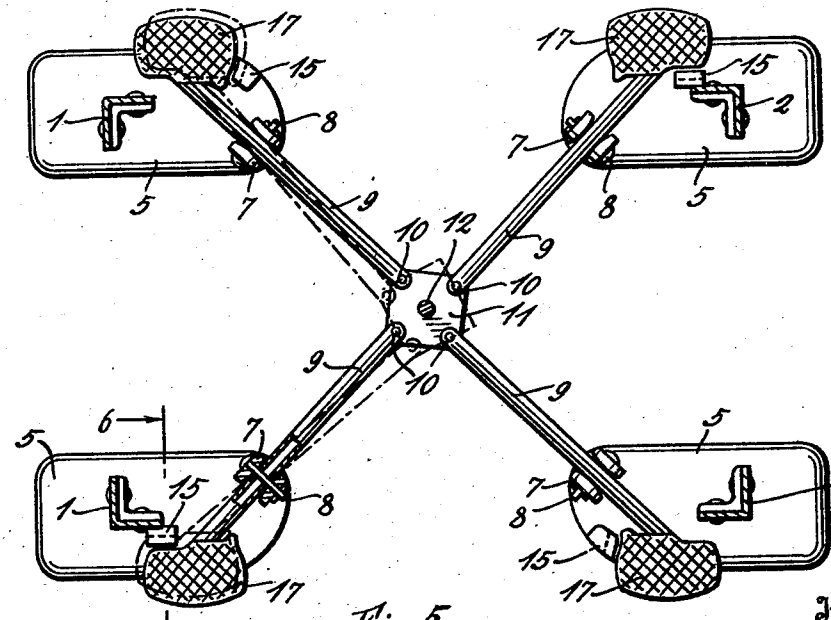


Fig. 5.

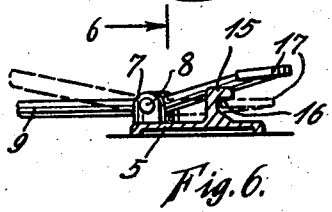


Fig. 6.

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UNITED STATES PATENT OFFICE

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DRY-STEAM FINISHER

Application filed December 30, 1927. Serial No. 243,704.

This invention relates to improvements in equipment for the finishing of cloth by steam and especially of the type employed for steaming and finishing cloth with a noticeable nap surface.

It is the object of this invention to produce a steam finisher of such shape that it is larger at the middle and smaller at the ends so as to more nearly conform to the shape of the garments to be cleaned. It is the further object of this invention to form the ends of the steam board in such a way that they have outwardly curved portions that will take the place in many respects of what is known as puff irons. It is the further object of this invention to produce steam finishing equipment which is noticeably faster than machines now on the market.

It is the further object to provide a steam finishing equipment having means comprising a partial vacuum in conjunction with air and steam for raising the nap of the garment while the latter is still damp and hot and drying and cooling it in this raised position. It is another object of this invention to provide a steam finisher which shall have a foot control that can be operated from either side of the board and by means of which the steam and air can be controlled.

The above and other objects which may become apparent as the description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail, reference for this purpose being had to the accompanying drawings in which the invention has been illustrated, and in which:

Fig. 1 is a top plan view of the board with parts thereof broken away and other parts shown in section so as to more clearly disclose the construction;

Fig. 2 is a section taken on line 2—2, Fig. 1;

Fig. 3 is a section taken on line 3—3, Fig. 2;

Fig. 4 is a section taken on line 4—4, Fig. 2;

Fig. 5 is a section taken on line 5—5, Fig. 2, and shows the pedal control for the valve mechanism;

Fig. 6 is a section taken on line 6—6, Fig. 5;

Fig. 7 is a section showing a modified form of construction; and

Fig. 8 is a section taken on line 8—8, Fig. 7.

This improved steam board comprises two hollow castings which have been designated by A and B. These sections are welded to the separating partition C so as to form a substantially unitary structure. This board is supported by four legs 1, 1 and 2, 2. The legs indicated by reference numerals 1 are slightly inclined while those indicated by reference numeral 2 are practically vertical. The lower surface of the board is provided with downwardly extending lugs 3 to which the upper ends of the legs are secured. These legs are preferably formed from angle irons and have secured to their lower ends feet 5 which are adapted to rest upon the supporting surface 6 and which are of considerable area and shaped in the manner illustrated in Fig. 5. Each of these feet are provided with two upwardly extending lugs 7 which are spaced apart and perforated for the reception of a pivot pin 8. A lever 9 is pivoted by means of pin 8 to the ear 7 in the manner shown in Fig. 5. It will be observed that the adjacent surfaces of lug 7 are curved convexly so that the levers 9 may have a transverse motion as well as a rocking motion in the vertical direction. The inner ends of levers 9 are pivoted at 10 to the corners of a plate 11. This plate has a central opening for the reception at the lower end of a rod 12. This rod has a reduced portion 13 that extends through the opening and is held against removal by means of a cotter pin 14. Each of the members 5 is provided with lugs 15. These lugs are provided with notches 16 into which the pedal portions 17 at the outer ends of levers 9 can be inserted so as to lock these levers in operative position. From Fig. 5 it will be observed that when the levers are in locked position, they occupy the dot and dash lines position and as they are all interconnected, they will all be simultaneously moved into engagement with the notches and will be

simultaneously released. As there are four of these pedal portions, two being located on each side of the machine, it is evident that the operator can manipulate them from almost any position that he may happen to occupy. The steam finisher sections have their upper surfaces provided with a large number of perforations 18 which permit the escape of steam or air from the inside.

Attention will now be directed to the shape of these sections, which can be best seen from Fig. 1. Section A has a uniform taper from the partition C to point D and is then curved outwardly so as to form a rounded end in the manner illustrated. Attention is called to the outwardly bent portion 19 which is also provided with perforations corresponding to perforations 18. This shape is especially well adapted for use in connection with the reconditioning of coats as the curved portions 19 fit into the arm openings and makes it possible to finish such garments quickly as practically the whole back is acted upon at one time.

The other board section B has a straight portion that extends from the partition C to line E and is thence uniformly tapered to point F. From point F, it is concavely curved to point G and thence convexly curved to point H and from point H to point I, it is concavely curved, while the part between points I is convex. The curved portions between points G and H and between I and I are especially designed to serve as puff irons for the treatment of parts having sharp curvatures and other parts that are inaccessible to the flatter portions of the board. I consider this particular shape of a steam finisher to be of great importance as it reduces the number of times a garment has to be turned in finishing and reduces the labor cost.

Located within each of the board sections A and B is a cylindrical housing 20, whose ends are closed in the manner shown. This housing may be formed from a piece of pipe of suitable size and serves as a manifold for the distribution of steam and air in the manner which will presently be described. The pipe 21 (Fig. 2) is connected to a source of steam under pressure, such as a steam boiler. This pipe terminates in a cross 22 to the upper end of which an L 23 is connected. From the upper end of the L a pipe 24, Fig. 4, extends to a T 25. A quick closing valve 26 is connected in pipe 24. This valve is of a normally closed type and is operated by means of a lever 27 which is pivoted at 28. When the outer end 29 of this lever is moved upwardly, the valve opens. From T 25, two pipes 30 extend upwardly and pass through the bottom of the steam finisher and have their upper ends opening within the cylindrical members 20. Valves 31 serve as means for controlling the flow of steam through pipes 30. Cylindrical members 20 are provided along one side with tubular openings 32 and 33. The tubular members 32 have been shown quite short, while those indicated by reference numeral 33 are longer and terminate at spaced distances along the sides of the finisher and have their ends bent inwardly in the manner indicated by reference numeral 34, or they may be straight in the manner indicated in connection with section B. When steam is admitted into the cylinders by means of pipes 30, it will escape through the tubular members 32 and 33 and be released within the interior of the steam finisher sections from whence the steam will pass outwardly through the perforations 18. The interior of the steam finisher sections are heated by means of high pressure steam contained in the pipes 35 which also serve to heat any air that is passed through the finisher. These pipes enter the steam boards at 36 and pass through the interior of the cylindrical members 20 and make several complete loops within the interior of the finisher sections and pass outwardly at 37. The feed ends of these pipes are connected with pipes 38 that extend downwardly to the L's 39 and thence to the side openings of the cross 22. The interiors of pipes 35 are therefore in communication with the steam supply so that live steam will constantly be present and maintain the interior of the steam finisher at a high temperature. The discharge ends of pipe 37 may be provided with small openings which permit the steam to escape slowly or may be connected with a return pipe so that the condensed steam will be returned to the boiler. Extending transversely of steam finisher section A is a partition member 40 that serves to support the pipes and also acts as a baffle to assist in the proper distribution of the steam. The rod 12 whose lower end is connected with plate 11, has its upper end pivoted to the free end of lever 27 in the manner shown in Fig. 2 and therefore whenever the operator presses down on the pedal 17, rod 12 will be raised and this will open valve 26, so as to permit steam to flow into pipes 30 and into the cylindrical members 20. If the operator desires to maintain this valve open for some length of time, he moves the pedal into dotted line position so as to bring its edge into the notch 16 and thereby latch it in position. When the valve 26 is to be closed, the operator may give any of the pedals 17 a kick tending to move them from dotted line to full line position, and thus release them and permit the valve to close. The steam that issues from pipes 32 and 33 becomes superheated by coming in contact with the heater pipes 35 and therefore it issues through the openings 18 as dry steam.

After the garments have been subjected to the steam treatment, it is necessary to dry them because if they are removed from the

steam finisher in a moist condition, they will not retain their form so well. I have found that the most satisfactory way of drying garments that have been steam treated, is to subject them to a blast of warm air, which naturally has a tendency to evaporate the moisture and to facilitate the drying. For the purpose of providing air for this purpose, I have equipped my finisher with a blower comprising a fan 41 which is directly connected to an electric motor 42. This fan and motor are constructed in a manner similar to the ordinary vacuum cleaner unit now almost universally employed. The exhaust port of fan 41 is formed by a tubular member 43 that extends upwardly and is divided so as to form two branches 44 and 45. Each of these branches terminates in a quick opening gate valve 46, such as the one illustrated in Fig. 3. These valves are controlled by means of handles 47 and serve to open or close the passageway through the branch pipes 44 and 45. From the valve 46 that is attached to branch pipe 44, a pipe 48 extends to the interior of the cylindrical section 20 within the board section B and from the valve 46 that is attached to branch pipe 45 a pipe 49 extends to the interior of cylindrical member 20 within board section A. It is now evident that when the blower is operated that air can be directed into either or both of the cylindrical members 20 and this air will pass outwardly through tubular members 32 and 33 which distribute it along the interior of the board directly beneath the heating pipes 35. Attached to the intake opening of the fan is a flexible hose 50 whose free end is provided with a nozzle 51. During the drying operation the nozzle 51 is passed over the garment while the air is permitted to flow as above described, thereby subjecting it to a suction which tends to raise the nap and sets it permanently in this raised position and removes any lint therefrom at the same time. I have found that by subjecting the garment to this outward suction while it is still hot and before it is entirely dry and to the action of the air, that a much better and more rapid finish can be obtained, due to the fact that the nap will be raised while it is still slightly moist, and will be dried in raised position, and which actually is effective for the purpose of retaining the nap in the desired position for a much longer time than if the nap is raised by any other method. I therefore consider that the method of finishing the garment by means of applying a suction nozzle to the garment and then a stream of hot air passed outwardly through the garment while the fibers are still moist and while the garment is still hot is an important part of my invention.

It is sometimes necessary or desirable to employ the fan 41 for the purpose of removing lint from garments and for this purpose I have provided the conduit 43 with a lateral branch opening 52 to which a quick acting gate valve 46 is attached. A lint bag 53 of the type ordinarily employed in connection with vacuum cleaners, is secured to the other side of this valve, and when the fan is to be used for cleaning, the valves 46 in branch pipes 44 and 45 are closed and valve 46 between the lint bag and the exhaust pipe 43 is open, so that if the fan is now operated, the air from the exhaust port will pass into the lint bag 53 which will separate the lint in the usual manner. Since it is never necessary to employ the lint bag 53 except when the suction nozzle 51 is used, I may provide a connection 54 between the handle 47 and the end of the suction tube 50, which is applied to the intake port of the fan. When tube 50 is in place, the connection 54 permits the valve to be opened, but when the intake tube 50 is not in use, it is detached from the fan and supported on a hook 55 which is located such a distance from the valve 46 that the connecting chain 54 will close the valve, and therefore the valve will always be closed whenever the suction tube 50 is disconnected from the fan.

In Fig. 7 I have shown a slightly modified form of construction in which the partition member C and the two cylindrical members 20 have been dispensed with. In lieu of the parts just mentioned, I have provided a casting consisting of a flat bottom 56, two end members 57, a central vertical partition 58, and inclined top members 59. The members forming the tops of the board sections A and B are welded to each other and to the central compartment along the transverse line 60, and the bottoms of these boards are welded to the central section along line 61. This arrangement is otherwise the same as that already explained but when the modified construction is used, the heating pipes 35 do not pass through the compartments as they do through the cylindrical members 20.

From the above description it will be apparent that I have produced a steam board of novel shape which is provided with means for drying the steam and which is also provided with means for passing dry heated air through the garments while they are still hot and moist and for raising and setting the nap by means of a suction device.

Attention is called to Fig. 8 which shows a modified construction in which the steam distribution pipes 33 are located directly below the coils of the steam pipe 35 and are provided with openings 33^a on their upper surfaces. The steam emerges through holes 33^a and impinges on the under surface of the steam pipe which superheats the steam and dries it.

Having described the invention what is claimed as new is:

1. A device of the class described comprising, in combination, a hollow steam finisher

whose upper surface is slightly convex and provided with a plurality of openings, a steam coil located within the finisher directly below the top member, a manifold located within the finisher, a plurality of pipes of different length extending from the manifold to spaced points within the finisher below the steam coil, means for conducting live steam to the interior of the manifold, an air compressing device having an exhaust port, means for conducting air from the exhaust port to the manifold, and means for controlling the flow of steam and the flow of air.

2. A device of the class described comprising, in combination, a hollow steam finisher having its upper surface provided with a large number of small openings, means for heating the interior of the finisher, means for releasing live steam within the interior of the finisher, whereby live steam will escape through the openings, an air blower having an intake and an outlet port, means for conducting air from the outlet port to the interior of the finisher, means for controlling the flow of live steam and of air, a flexible tubular conduit connected with the intake port of the blower, and a suction nozzle secured to the free end of said conduit.

3. A device of the class described, comprising, in combination, a hollow steam finisher, means for supporting the finisher, said supporting means comprising a plurality of spaced legs, a steam pipe having one end opening within the steam finisher, a normally closed valve in said pipe, a lever for opening the valve, a rod pivoted to the free end of the lever, a plate rotatably secured to the lower end of the rod, a plurality of levers pivoted at one end to said plate, a fulcrum to which each lever is pivotally attached at a point intermediate its ends, a pedal at the free end of each lever, and a lug adjacent each pedal, said lugs each having a notch, for the reception of a portion of the pedal when the latter is depressed and moved towards one side.

4. An apparatus for reconditioning cloth and for raising the nap which comprises, in combination, a curved perforated surface on which the cloth may be supported, means for heating the surface, means for forcing steam through the openings of said surface, means for cutting off the flow of steam, means for forcing air through the openings, means for heating the air and means for simultaneously blowing air through the cloth from the side nearest the heated surface and subjecting the outer surface to the action of a suction nozzle which serves to raise the nap, while the outward flow of heated air serves to dry the nap while it is in raised position.

5. A device of the class described, comprising, in combination, a hollow steam finisher having its upper surface provided with perforations, a steam heat coil located within the finisher, means for conducting live steam to the interior of the finisher, said means comprising a pipe having a valve, a blower having an air delivery port, a conduit extending from the delivery port to the interior of the finisher, a valve in said conduit, said blower having an intake port, and a flexible hose connected with the intake port, the free end of said hose having a nozzle.

6. A device of the class described, comprising, in combination, a hollow steam finisher having its upper surface provided with perforations, a steam heat coil located within the finisher, a manifold located within the finisher, means for conducting live steam to the interior of the manifold, said means comprising a pipe having a valve, a blower having an air delivery port, a conduit extending from the delivery port to the interior of the manifold, a valve in said conduit, said blower having an intake port, and a flexible suction tube secured to the intake port, the free end of said tube having a nozzle.

In testimony whereof I affix my signature.

IRWIN W. COX.